Space Weather Forecast

Issued on Saturday, 29 April 2023 at 13:05 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1 Minor - R2 Moderate radio blackouts throughout. Slight and declining chance of G1/Minor geomagnetic storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the past 24 hours, with several Common-class flares, with the largest event a Common-class flare originating from the largest sunspot region located just west of centre disc in the southern hemisphere. One of these is the most interesting region on the disc, with growth in intermediate spots and magnetic complexity within these spots. A region in the northwest has also produced a long period C-flare, with this region having grown in the last 24 hours. The other two sunspot regions on the disc are small and more simple.

There have been numerous mainly weak and faint eruptions appearing in coronagraph imagery in the last 24 hours. Generally speaking, any Coronal Mass Ejections (CMEs) are considered most likely to miss Earth, although some glancing influence from several different sources cannot be ruled out in the coming days. As a result, the forecast should be considered of lower than average confidence at present.

Meanwhile, an eruption which occurred at 29/0400 UTC near the vicinity of the largest sunspot region, which is located just west of centre disc, produced a CME, This CME is currently under going analysis for any potential Earth-directed component.

Solar Wind / Geomagnetic Activity: The solar wind was reflective of continuing coronal hole fast wind enhancement. The wind speed was strong, mainly between 600-700 km/s, briefly declining to Elevated levels, below 600km/s. The Interplanetary Magnetic Field was weak, with the north-south component mostly weakly southward directed. Geomagnetic activity was Unsettled to Active (Kp 3-4).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain Low, with a chance of reaching Moderate levels through the coming days.

Solar Wind / Geomagnetic Activity: There have been numerous mainly faint eruptions appearing in coronagraph imagery over the past few days. All of these CMEs are considered most likely to miss Earth, but with a low chance of the odd glancing blow at times through the forecast period. The current coronal hole fast wind is expected to start the period at strong levels, with wind speeds starting to ease into Day 2 (30 Apr). A further coronal hole may prolong elevated or slightly elevated wind speeds into Days 3 and 4 (01-02 May).

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Geomagnetic activity is expected to be Unsettled to Active at first with a slight chance of G1/Minor Storm intervals. This gradually declining to become mostly Quiet through the period, although Unsettled to Active intervals are possible once again should we see any glancing CME influence.

Energetic Particles / Solar Radiation: Overall no solar radiation storms are expected, but there is a slight chance of a storm occurring, mainly due to the westward advance of the largest spot.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

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Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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